

WHAT IS CLAIMED IS:

5 Claim 1. A rethermalization system for use with food trays having a hot side and a cold side, the system being operable to maintain both the hot side and the cold side of each tray at a cold temperature and of heating the hot side from the cold temperature to a hot temperature while simultaneously maintaining the cold side at the cold temperature, the system comprising:

a plurality of food trays, each tray having a cold food side, a hot food side; and

10 a rethermalization unit having a first compartment accessible via a first end and configured for being loaded with the trays, a first thermal system adjacent a first interior side of the rethermalization unit so that when the trays are within the first compartment the hot food side of each tray is directly adjacent the first thermal system for thermal treatment thereby, a second thermal system adjacent a second interior side of the rethermalization unit so that when the trays are within the first compartment the cold food side of each tray is directly adjacent the second thermal system for thermal treatment thereby, a compressor system operatively associated with the first and second thermal systems, and a microprocessor-based control system for operating the first and second thermal systems and the compressor system to effect desired thermal treatment of food on the food trays, wherein,

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the first thermal system includes a heating source, a refrigeration coil, and a blower for circulating heat from the heating source and cold from the refrigeration coil,

the second thermal system includes first and second refrigeration coils and a blower for circulating cold from the first and second refrigeration coils, and

the control system being operable so as to activate the refrigeration coil of the first thermal system and the first refrigeration coil of the second thermal system and to deactivate the second refrigeration coil of the second thermal system when the rethermalization system is operated to maintain both the hot side and the cold side of each tray at a desired cold temperature, and to deactivate the refrigeration coil of the first thermal system, activate the heating source of the first thermal system, and activate both the first and second refrigeration coils of the second thermal system when the rethermalization system is operated to heat the hot side from the desired cold temperature to a desired hot temperature while simultaneously maintaining the cold side at the desired cold temperature.

Claim 2. The system of Claim 1, further comprising a cassette configured for receiving the plurality of the trays, the cassette including a plurality of spaced apart dividers, wherein the dividers are substantially vertically aligned with one another and spaced apart a distance from one another so as to define a receiver between each

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A1 divider, each receiver being dimensioned so as to closely receive one of the food trays so that when the cassette is loaded with the plurality of trays, the dividers define a thermal barrier between the hot food side and the cold food side of each tray; and a cassette placement sensor located within the rethermalization unit and operatively associated with the control system for sensing initial placement of the cassette within the rethermalization unit, wherein the control system initiates operation of the first and second thermal systems when the cassette is placed in the rethermalization unit to maintain both the hot side and the cold side of each tray at a desired cold temperature.

Claim 3. The system of Claim 2, wherein the rethermalization unit further includes a temperature monitor for monitoring the temperature of the first compartment and operatively associated with the control system and the cassette placement sensor so that initiation of operation of the first and second thermal system is deactivated if the temperature of the first compartment exceeds a predetermined threshold at the time the cassette is placed into the first compartment.

Claim 4. The system of Claim 1, further comprising a compressor system temperature monitor associated with the compressor system for sensing temperatures associated with the operation of the compressor system and operatively associated with the control system for inputting temperature information thereto relating to the

5 ^{July 91} compressor system, wherein when the temperature of the compressor system exceeds a predetermined value the control system generates a signal to cease operation of the compressor system.

Claim 5. The system of Claim 1, further comprising a compressor system pressure monitor associated with the compressor system for sensing pressures associated with the operation of the compressor system and operatively associated with the control system for inputting pressure information thereto relating to the compressor system, wherein when the pressure of the compressor system exceeds a predetermined value the control system generates a signal to cease operation of the compressor system.

Claim 6. The system of Claim 1, further comprising a cassette configured for receiving the plurality of the trays, the cassette including a plurality of spaced apart dividers, wherein the dividers are substantially vertically aligned with one another and spaced apart a distance from one another so as to define a receiver between each divider, each receiver being dimensioned so as to closely receive one of the food trays so that when the cassette is loaded with the plurality of trays, the dividers define a thermal barrier between the hot food side and the cold food side of each tray; and a

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15 (Sub P1) the first latch pin and a second latch pin releasably engageable with the first latch system of the first portage unit.

Claim 9. A rethermalization system for use with food trays having a hot side and a cold side, the system being operable to maintain both the hot side and the cold side of each tray at a cold temperature and of heating the hot side from the cold temperature to a hot temperature while simultaneously maintaining the cold side at the cold temperature, the system comprising:

a plurality of food trays, each tray having a cold food side, a hot food side;

a cassette configured for receiving the plurality of the trays, the cassette including a plurality of spaced apart dividers, wherein the dividers are substantially vertically aligned with one another and spaced apart a distance from one another so as to define a receiver between each divider, each receiver being dimensioned so as to closely receive one of the food trays so that when the cassette is loaded with the plurality of trays, the dividers and the trays received in the receivers of the dividers define a thermal barrier between the hot food side and the cold food side of each tray;

a rethermalization unit having a first compartment accessible via a first end and configured for receiving the cassette when it is loaded with the trays, a

a cassette placement sensor located within the rethermalization unit and operatively associated with the control system for sensing initial placement of the cassette within the rethermalization unit, wherein the control system initiates operation of the first and second thermal systems when the cassette is placed in the rethermalization unit to maintain both the hot side and the cold side of each tray at a desired cold temperature.

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A1</sup> so that initiation of operation of the first and second thermal system is deactivated if the temperature of the first compartment exceeds a predetermined threshold at the time the cassette is placed into the first compartment.

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5 Claim 11. The system of Claim 9, further comprising a compressor system temperature monitor associated with the compressor system for sensing temperatures associated with the operation of the compressor system and operatively associated with the control system for inputting temperature information thereto relating to the compressor system, wherein when the temperature of the compressor system exceeds a predetermined value the control system generates a signal to cease operation of the compressor system.

5 Claim 12. The system of Claim 9, further comprising a compressor system pressure monitor associated with the compressor system for sensing pressures associated with the operation of the compressor system and operatively associated with the control system for inputting pressure information thereto relating to the compressor system, wherein when the pressure of the compressor system exceeds a predetermined value the control system generates a signal to cease operation of the compressor system.

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Claim 13.

A rethermalization system for use with food trays having a hot side and a cold side, the system being operable to maintain both the hot side and the cold side of each tray at a cold temperature and of heating the hot side from the cold temperature to a hot temperature while simultaneously maintaining the cold side at the cold temperature, the system comprising:

a plurality of food trays, each tray having a cold food side, a hot food side;

a cassette configured for receiving the plurality of the trays, the cassette including a plurality of spaced apart dividers, wherein the dividers are substantially vertically aligned with one another and spaced apart a distance from one another so as to define a receiver between each divider, each receiver being dimensioned so as to closely receive one of the food trays so that when the cassette is loaded with the plurality of trays, the dividers and the trays received in the receivers of the dividers define a thermal barrier between the hot food side and the cold food side of each tray;

a rethermalization unit having a first compartment accessible via a first end and configured for receiving the cassette when it is loaded with the trays, a first thermal system adjacent a first interior side of the rethermalization unit so that when the tray loaded cassette is received within the first compartment the hot food side of each tray is directly adjacent the first thermal system for thermal treatment thereby,

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food side;

10 a cassette configured for receiving the plurality of the trays, the cassette including a plurality of spaced apart dividers, wherein the dividers are substantially vertically aligned with one another and define a receiver between each divider, each receiver being dimensioned so as to closely receive one of the food trays so that when the cassette is loaded with the plurality of trays, the dividers and the trays received in the receivers of the dividers define a thermal barrier between the hot food side and the cold food side of each tray;

15 a rethermalization unit having a first compartment accessible via a first end and configured for receiving the cassette when it is loaded with the trays, a first thermal system adjacent a first interior side of the rethermalization unit so that when the tray loaded cassette is received within the first compartment the hot food side of each tray is directly adjacent the first thermal system for thermal treatment thereby, 20 a second thermal system adjacent a second interior side of the rethermalization unit so that when the tray loaded cassette is received within the first compartment the cold food side of each tray is directly adjacent the second thermal system for thermal treatment thereby, a compressor system operatively associated with the first and second thermal systems, and a microprocessor-based control system for operating the first and second

25 *Sub A-1* thermal systems and the compressor system to effect desired thermal treatment of food on the food trays, and

a compressor system pressure monitor associated with the compressor system for sensing pressures associated with the operation of the compressor system and operatively associated with the control system for inputting pressure information thereto relating to the compressor system, wherein when the pressure of the compressor system exceeds a predetermined value the control system generates a signal to cease operation of the compressor system.

Claim 15. A rethermalization system for use with food trays having a hot side and a cold side, the system being operable to maintain both the hot side and the cold side of each tray at a cold temperature and of heating the hot side from the cold temperature to a hot temperature while simultaneously maintaining the cold side at the cold temperature, the system comprising:

a rethermalization unit having a first compartment accessible via a first end, a first thermal system adjacent a first interior side of the rethermalization unit, a second thermal system adjacent a second interior side of the rethermalization unit, a compressor system operatively associated with the first and second thermal systems, and a microprocessor-based control system for operating the first and second

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thermal systems and the compressor system to effect desired thermal treatment of food
on the food trays inside the first compartment, and

first and second portage units, the first and second portage units
each being configured for receiving the cassette and for transferring the cassette to the
first compartment and for removing the cassette from the first compartment, wherein
the rethermalization unit includes a first latch pin adjacent the first compartment, the
first portage unit has a first end including a first latch system releasably engageable
with the first latch pin, and the second portage unit has first and second opposite ends,
the first end of the second portage unit having a second latch system releasably
engageable with the first latch pin and a second latch pin releasably engageable with
the first latch system of the first portage unit.

Claim 16. The system of Claim 1, further comprising a plurality of the
second portage units, wherein each of the second portage units is connectable to
another of the second portage units via their respective latch systems and latch pins.

Claim 17. A method for rethermalizing food trays having a hot side and a
cold side to maintain both the hot side and the cold side of each tray at a cold
temperature for a desired period of time and thereafter heating the hot side from the

5 *July 14* cold temperature to a hot temperature while simultaneously maintaining the cold side at the cold temperature, the method comprising the steps of:

providing a plurality of food trays, each tray having a cold food side, a hot food side;

providing a rethermalization unit configured for being loaded with the trays, the rethermalization unit having a first thermal system including a heating source and a refrigeration source, and a second thermal system including first and second refrigeration sources,

operating the rethermalization system to maintain both the hot side and the cold side of each tray at a desired cold temperature by activating the refrigeration source of the first thermal system and the first refrigeration source of the second thermal system and deactivating the second refrigeration source of the second thermal system; and

operating the rethermalization system to heat the hot side from the desired cold temperature to a desired hot temperature while simultaneously maintaining the cold side at the desired cold temperature by deactivating the refrigeration source of the first thermal system, activating the heating source of the first thermal system, and activating both the first and second refrigeration sources of the second thermal system.

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Claim 18. The method of Claim 17, wherein the refrigeration sources comprise refrigeration coils.

Claim 19. A method for rethermalizing food trays having a hot side and a cold side to maintain both the hot side and the cold side of each tray at a cold temperature for a desired period of time and thereafter heating the hot side from the cold temperature to a hot temperature while simultaneously maintaining the cold side at the cold temperature, the method comprising the steps of:

providing a plurality of food trays, each tray having a cold food side, a hot food side;

providing a rethermalization unit configured for being loaded with the trays, the rethermalization unit having a thermal system to selectively provide heating and cooling to the unit, a cassette configured for receiving the plurality of the trays, and a cassette placement sensor for sensing initial placement of the cassette within the rethermalization unit,

sensing when the cassette is initially placed in the rethermalization unit and initiating operation of the thermal system to maintain both the hot side and the cold side of each tray at a desired cold temperature when the cassette is placed in the rethermalization unit, and

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thereafter heating the hot side of each tray to a desired hot temperature while substantially maintaining the cold side of each tray at the desired cold temperature.

Claim 20. A method for handling food trays to be selectively refrigerated and rethermalized, the method comprising the steps of:

providing a plurality of food trays;

providing a cassette configured for receiving the plurality of the trays;

providing a rethermalization unit configured for being loaded with the trays,

providing a plurality of portage units selectively interconnectable to one another and each portage unit being configured for receiving the cassette and for transferring and removing the cassette from the rethermalization unit,

loading the trays on the cassette and loading the cassette onto a first one of the portage units;

interconnecting the portage unit loaded with the cassette to a second of the portage units;

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transferring the cassette loaded with the trays from the first one of the portage unit to the second one of the portage units while the portage units are interconnected; and

connecting the second one of the portage units to the rethermalization unit and transferring the cassette loaded with the trays from the second one of the portage units to the rethermalization unit.

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